SEQUENCE LISTING

<110> Nicolaides, Nicholas C
       Sass, Philip M
       Grasso, Luigi M
       Kline, J Bradford

<120> METHODS FOR GENERATING ANTIBIOTIC RESISTANT MICROBES AND NOVEL
       ANTIBIOTICS

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<140> 00/000,000
<141> 2001-07-25

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Leu Asp Ala Gly Ala Thr Ser Val Asp Val Lys Leu Glu Asn Tyr Gly
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Phe Asp Lys Ile Glu Val Arg Asp Asn Gly Glu Gly Ile Lys Ala Val
    50                  55                  60


Asp Ala Pro Val Met Ala Met Lys Tyr Tyr Thr Ser Lys Ile Asn Ser
65                  70                  75                  80


His Glu Asp Leu Glu Asn Leu Thr Thr Tyr Gly Phe Arg Gly Glu Ala
            85                  90                  95


Leu Gly Ser Ile Cys Cys Ile Ala Glu Val Leu Ile Thr Thr Arg Thr
            100                 105                 110


Ala Ala Asp Asn Phe Ser Thr Gln Tyr Val Leu Asp Gly Ser Gly His
        115                 120                 125


Ile Leu Ser Gln Lys Pro Ser His Leu Gly Gln Gly Thr Thr Val Thr
    130                 135                 140


Ala Leu Arg Leu Phe Lys Asn Leu Pro Val Arg Lys Gln Phe Tyr Ser
145                 150                 155                 160


Thr Ala Lys Lys Cys Lys Asp Glu Ile Lys Lys Ile Gln Asp Leu Leu
                165                 170                 175


Met Ser Phe Gly Ile Leu Lys Pro Asp Leu Arg Ile Val Phe Val His
            180                 185                 190


Asn Lys Ala Val Ile Trp Gln Lys Ser Arg Val Ser Asp His Lys Met
        195                 200                 205


Ala Leu Met Ser Val Leu Gly Thr Ala Val Met Asn Asn Met Glu Ser
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Pro Lys Cys Asp Ala Asp His Ser Phe Thr Ser Leu Ser Thr Pro Glu
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Arg Ser Phe Ile Phe Ile Asn Ser Arg Pro Val His Gln Lys Asp Ile
            260             265             270

Leu Lys Leu Ile Arg His His Tyr Asn Leu Lys Cys Leu Lys Glu Ser
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Thr Arg Leu Tyr Pro Val Phe Phe Leu Lys Ile Asp Val Pro Thr Ala
    290             295             300

Asp Val Asp Val Asn Leu Thr Pro Asp Lys Ser Gln Val Leu Leu Gln
305             310             315             320

Asn Lys Glu Ser Val Leu Ile Ala Leu Glu Asn Leu Met Thr Thr Cys
            325             330             335

Tyr Gly Pro Leu Pro Ser Thr Asn Ser Tyr Glu Asn Asn Lys Thr Asp
        340             345             350

Val Ser Ala Ala Asp Ile Val Leu Ser Lys Thr Ala Glu Thr Asp Val
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Leu Phe Asn Lys Val Glu Ser Ser Gly Lys Asn Tyr Ser Asn Val Asp
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Thr Ser Val Ile Pro Phe Gln Asn Asp Met His Asn Asp Glu Ser Gly
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Lys Asn Thr Asp Asp Cys Leu Asn His Gln Ile Ser Ile Gly Asp Phe
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Gly Tyr Gly His Cys Ser Ser Glu Ile Ser Asn Ile Asp Lys Asn Thr
        420             425             430

Lys Asn Ala Phe Gln Asp Ile Ser Met Ser Asn Val Ser Trp Glu Asn
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Ser Gln Thr Glu Tyr Ser Lys Thr Cys Phe Ile Ser Ser Val Lys His
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Thr Gln Ser Glu Asn Gly Asn Lys Asp His Ile Asp Glu Ser Gly Glu
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Glu Pro Val Lys Ile Leu Val Pro Glu Lys Ser Leu Pro Cys Lys Val
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Ser Asn Asn Asn Tyr Pro Ile Pro Glu Gln Met Asn Leu Asn Glu Asp
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Ser Cys Asn Lys Lys Ser Asn Val Ile Asp Asn Lys Ser Gly Lys Val
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Thr Ala Tyr Asp Leu Leu Ser Asn Arg Val Ile Lys Lys Pro Met Ser
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Ala Ser Ala Leu Phe Val Gln Asp His Arg Pro Gln Phe Leu Ile Glu
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Asn Pro Lys Thr Ser Leu Glu Asp Ala Thr Leu Gln Ile Glu Glu Leu
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Trp Lys Thr Leu Ser Glu Glu Glu Lys Leu Lys Tyr Glu Glu Lys Ala
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625                 630                 635                 640

Gln Glu Ser Gln Met Ser Leu Lys Asp Gly Arg Lys Lys Ile Lys Pro
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Thr Ser Ala Trp Asn Leu Ala Gln Lys His Lys Leu Lys Thr Ser Leu
            660                 665                 670

Ser Asn Gln Pro Lys Leu Asp Glu Leu Leu Gln Ser Gln Ile Glu Lys
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Arg Arg Ser Gln Asn Ile Lys Met Val Gln Ile Pro Phe Ser Met Lys
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Asn Leu Lys Ile Asn Phe Lys Lys Gln Asn Lys Val Asp Leu Glu Glu
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Lys Asp Glu Pro Cys Leu Ile His Asn Leu Arg Phe Pro Asp Ala Trp
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Ala Glu Pro Leu Glu Lys Pro Ile Met Leu Thr Glu Ser Leu Phe Asn
    770                 775                 780

Gly Ser His Tyr Leu Asp Val Leu Tyr Lys Met Thr Ala Asp Asp Gln
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Arg Tyr Ser Gly Ser Thr Tyr Leu Ser Asp Pro Arg Leu Thr Ala Asn
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Gly Phe Lys Ile Lys Leu Ile Pro Gly Val Ser Ile Thr Glu Asn Tyr
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Leu Glu Ile Glu Gly Met Ala Asn Cys Leu Pro Phe Tyr Gly Val Ala
            835                 840                 845

Asp Leu Lys Glu Ile Leu Asn Ala Ile Leu Asn Arg Asn Ala Lys Glu
    850                 855                 860

Val Tyr Glu Cys Arg Pro Arg Lys Val Ile Ser Tyr Leu Glu Gly Glu
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Ala Val Arg Leu Ser Arg Gln Leu Pro Met Tyr Leu Ser Lys Glu Asp
            885                 890                 895

Ile Gln Asp Ile Ile Tyr Arg Met Lys His Gln Phe Gly Asn Glu Ile
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Page 17

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Leu Asp Ala Gly Ala Thr Ser Val Asp Val Lys Leu Glu Asn Tyr Gly
        35                  40                  45


Phe Asp Lys Ile Glu Val Arg Asp Asn Gly Glu Gly Ile Lys Ala Val
    50                  55                  60


Asp Ala Pro Val Met Ala Met Lys Tyr Tyr Thr Ser Lys Ile Asn Ser
65                  70                  75                  80


His Glu Asp Leu Glu Asn Leu Thr Thr Tyr Gly Phe Arg Gly Glu Ala
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Page 18

Leu Gly Ser Ile Cys Cys Ile Ala Glu Val Leu Ile Thr Thr Arg Thr
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Ala Ala Asp Asn Phe Ser Thr Gln Tyr Val Leu Asp Gly Ser Gly His
    115   120   125

Ile Leu Ser Gln Lys Pro Ser His Leu Gly Gln Gly Thr Thr Val Thr
  130   135   140

Ala Leu Arg Leu Phe Lys Asn Leu Pro Val Arg Lys Gln Phe Tyr Ser
145   150   155   160

Thr Ala Lys Lys Cys Lys Asp Glu Ile Lys Lys Ile Gln Asp Leu Leu
    165   170   175

Met Ser Phe Gly Ile Leu Lys Pro Asp Leu Arg Ile Val Phe Val His
    180   185   190

Asn Lys Ala Val Ile Trp Gln Lys Ser Arg Val Ser Asp His Lys Met
  195   200   205

Ala Leu Met Ser Val Leu Gly Thr Ala Val Met Asn Asn Met Glu Ser
  210   215   220

Phe Gln Tyr His Ser Glu Glu Ser Gln Ile Tyr Leu Ser Gly Phe Leu
225   230   235   240

Pro Lys Cys Asp Ala Asp His Ser Phe Thr Ser Leu Ser Thr Pro Glu
    245   250   255

Arg Ser Phe Ile Phe Ile Asn Ser Arg Pro Val His Gln Lys Asp Ile
    260   265   270

Leu Lys Leu Ile Arg His His Tyr Asn Leu Lys Cys Leu Lys Glu Ser
    275   280   285

Thr Arg Leu Tyr Pro Val Phe Phe Leu Lys Ile Asp Val Pro Thr Ala
  290   295   300

Asp Val Asp Val Asn Leu Thr Pro Asp Lys Ser Gln Val Leu Leu Gln
305   310   315   320

Asn Lys Glu Ser Val Leu Ile Ala Leu Glu Asn Leu Met Thr Thr Cys
    325   330   335

Tyr Gly Pro Leu Pro Ser Thr Asn Ser Tyr Glu Asn Asn Lys Thr Asp

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Val Ser Ala Ala Asp Ile Val Leu Ser Lys Thr Ala Glu Thr Asp Val
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Leu Phe Asn Lys Val Glu Ser Ser Gly Lys Asn Tyr Ser Asn Val Asp
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Thr Ser Val Ile Pro Phe Gln Asn Asp Met His Asn Asp Glu Ser Gly
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Lys Asn Thr Asp Asp Cys Leu Asn His Gln Ile Ser Ile Gly Asp Phe
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Gly Tyr Gly His Cys Ser Ser Glu Ile Ser Asn Ile Asp Lys Asn Thr
            420                    425                    430

Lys Asn Ala Phe Gln Asp Ile Ser Met Ser Asn Val Ser Trp Glu Asn
        435                    440                    445

Ser Gln Thr Glu Tyr Ser Lys Thr Cys Phe Ile Ser Ser Val Lys His
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Thr Gln Ser Glu Asn Gly Asn Lys Asp His Ile Asp Glu Ser Gly Glu
465                    470                    475                    480

Asn Glu Glu Glu Ala Gly Leu Glu Asn Ser Ser Glu Ile Ser Ala Asp
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Glu Trp Ser Arg Gly Asn Ile Leu Lys Asn Ser Val Gly Glu Asn Ile
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Glu Pro Val Lys Ile Leu Val Pro Glu Lys Ser Leu Pro Cys Lys Val
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Ser Asn Asn Asn Tyr Pro Ile Pro Glu Gln Met Asn Leu Asn Glu Asp
        530                    535                    540

Ser Cys Asn Lys Lys Ser Asn Val Ile Asp Asn Lys Ser Gly Lys Val
545                    550                    555                    560

Thr Ala Tyr Asp Leu Leu Ser Asn Arg Val Ile Lys Lys Pro Met Ser
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Ala Ser Ala Leu Phe Val Gln Asp His Arg Pro Gln Phe Leu Ile Glu
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Asn Pro Lys Thr Ser Leu Glu Asp Ala Thr Leu Gln Ile Glu Glu Leu
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Gln Glu Ser Gln Met Ser Leu Lys Asp Gly Arg Lys Lys Ile Lys Pro
                645                 650                 655

Thr Ser Ala Trp Asn Leu Ala Gln Lys His Lys Leu Lys Thr Ser Leu
                660                 665                 670

Ser Asn Gln Pro Lys Leu Asp Glu Leu Leu Gln Ser Gln Ile Glu Lys
                675                 680                 685

Arg Arg Ser Gln Asn Ile Lys Met Val Gln Ile Pro Phe Ser Met Lys
    690                 695                 700

Asn Leu Lys Ile Asn Phe Lys Lys Gln Asn Lys Val Asp Leu Glu Glu
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Lys Asp Glu Pro Cys Leu Ile His Asn Leu Arg Phe Pro Asp Ala Trp
                725                 730                 735

Leu Met Thr Ser Lys Thr Glu Val Met Leu Leu Asn Pro Tyr Arg Val
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Glu Glu Ala Leu Leu Phe Lys Arg Leu Leu Glu Asn His Lys Leu Pro
    755                 760                 765

Ala Glu Pro Leu Glu Lys Pro Ile Met Leu Thr Glu Ser Leu Phe Asn
    770                 775                 780

Gly Ser His Tyr Leu Asp Val Leu Tyr Lys Met Thr Ala Asp Asp Gln
785                 790                 795                 800

Arg Tyr Ser Gly Ser Thr Tyr Leu Ser Asp Pro Arg Leu Thr Ala Asn
                805                 810                 815

Gly Phe Lys Ile Lys Leu Ile Pro Gly Val Ser Ile Thr Glu Asn Tyr
                820                 825                 830

Leu Glu Ile Glu Gly Met Ala Asn Cys Leu Pro Phe Tyr Gly Val Ala
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Asp Leu Lys Glu Ile Leu Asn Ala Ile Leu Asn Arg Asn Ala Lys Glu
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Page 21

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Val Tyr Glu Cys Arg Pro Arg Lys Val Ile Ser Tyr Leu Glu Gly Glu
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Ala Val Arg Leu Ser Arg Gln Leu Pro Met Tyr Leu Ser Lys Glu Asp
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Ile Gln Asp Ile Ile Tyr Arg Met Lys His Gln Phe Gly Asn Glu Ile
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Lys Glu Cys Val His Gly Arg Pro Phe Phe His His Leu Thr Tyr Leu
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Pro Glu Thr Thr
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            35   40   45

Asp Ala Leu Leu Ala Ala Arg Glu Val Phe Lys Thr Gln Gly Val Ile
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Lys Tyr Met Gly Pro Ala Gly Ala Lys Asn Leu Gln Ser Val Val Leu
65   70   75   80

Ser Lys Met Asn Phe Glu Ser Phe Val Lys Asp Leu Leu Leu Val Arg
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Gln Tyr Arg Val Glu Val Tyr Lys Asn Arg Ala Gly Asn Lys Ala Ser
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Lys Glu Asn Asp Trp Tyr Leu Ala Tyr Lys Ala Ser Pro Gly Asn Leu
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Ser Gln Phe Glu Asp Ile Leu Phe Gly Asn Asn Asp Met Ser Ala Ser
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Ile Gly Val Val Gly Val Lys Met Ser Ala Val Asp Gly Gln Arg Gln
145   150   155   160

Val Gly Val Gly Tyr Val Asp Ser Ile Gln Arg Lys Leu Gly Leu Cys
                165   170   175

Glu Phe Pro Asp Asn Asp Gln Phe Ser Asn Leu Glu Ala Leu Leu Ile
                180   185   190

Gln Ile Gly Pro Lys Glu Cys Val Leu Pro Gly Gly Glu Thr Ala Gly

Page 24

Asp Met Gly Lys Leu Arg Gln Ile Ile Gln Arg Gly Gly Ile Leu Ile
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Thr Glu Arg Lys Lys Ala Asp Phe Ser Thr Lys Asp Ile Tyr Gln Asp
225   230   235   240

Leu Asn Arg Leu Leu Lys Gly Lys Lys Gly Glu Gln Met Asn Ser Ala
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Val Leu Pro Glu Met Glu Asn Gln Val Ala Val Ser Ser Leu Ser Ala
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Val Ile Lys Phe Leu Glu Leu Leu Ser Asp Asp Ser Asn Phe Gly Gln
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Phe Glu Leu Thr Thr Phe Asp Phe Ser Gln Tyr Met Lys Leu Asp Ile
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Thr Gly Ser Gln Ser Leu Ala Ala Leu Leu Asn Lys Cys Lys Thr Pro
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Gln Gly Gln Arg Leu Val Asn Gln Trp Ile Lys Gln Pro Leu Met Asp
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Glu Glu Tyr Thr Lys Asn Lys Thr Glu Tyr Glu Glu Ala Gln Asp Ala
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Gln Thr Leu Asn Asp Val Leu Ala Gln Leu Asp Ala Val Val Ser Phe
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Cys Val Glu Val Gln Asp Glu Ile Ala Phe Ile Pro Asn Asp Val Tyr
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Phe Glu Lys Asp Lys Gln Met Phe His Ile Ile Thr Gly Pro Asn Met
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Gly Gly Lys Ser Thr Tyr Ile Arg Gln Thr Gly Val Ile Val Leu Met
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Arg Ser Ala Thr Lys Asp Ser Leu Ile Ile Ile Asp Glu Leu Gly Arg
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Tyr Ile Ala Thr Lys Ile Gly Ala Phe Cys Met Phe Ala Thr His Phe
    770   775   780

His Glu Leu Thr Ala Leu Ala Asn Gln Ile Pro Thr Val Asn Asn Leu
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His Val Thr Ala Leu Thr Thr Glu Glu Thr Leu Thr Met Leu Tyr Gln
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Val Lys Lys Gly Val Cys Asp Gln Ser Phe Gly Ile His Val Ala Glu
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Leu Ala Asn Phe Pro Lys His Val Ile Glu Cys Ala Lys Gln Lys Ala
            835   840   845

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    850   855   860

Ile Met Glu Pro Ala Ala Lys Lys Cys Tyr Leu Glu Arg Glu Gln Gly
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Glu Lys Ile Ile Gln Glu Phe Leu Ser Lys Val Lys Gln Met Pro Phe
                885   890   895

Thr Glu Met Ser Glu Glu Asn Ile Thr Ile Lys Leu Lys Gln Leu Lys
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Val Ile Val Lys Glu Gly Gly Leu Lys Leu Ile Gln Ile Gln Asp Asn
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Gly Thr Gly Ile Arg Lys Glu Asp Leu Asp Ile Val Cys Glu Arg Phe
65   70   75   80

Thr Thr Ser Lys Leu Gln Ser Phe Glu Asp Leu Ala Ser Ile Ser Thr
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Tyr Gly Phe Arg Gly Glu Ala Leu Ala Ser Ile Ser His Val Ala His
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Val Thr Ile Thr Thr Lys Thr Ala Asp Gly Lys Cys Ala Tyr Arg Ala
            115   120   125

Ser Tyr Ser Asp Gly Lys Leu Lys Ala Pro Pro Lys Pro Cys Ala Gly
        130   135   140

Page 29

Asn Gln Gly Thr Gln Ile Thr Val Glu Asp Leu Phe Tyr Asn Ile Ala
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Thr Arg Arg Lys Ala Leu Lys Asn Pro Ser Glu Glu Tyr Gly Lys Ile
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Asn Ala Ser Thr Val Asp Asn Ile Arg Ser Ile Phe Gly Asn Ala Val
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225   230   235   240

Lys Met Asn Gly Tyr Ile Ser Asn Ala Asn Tyr Ser Val Lys Lys Cys
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Ile Phe Leu Leu Phe Ile Asn His Arg Leu Val Glu Ser Thr Ser Leu
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His Pro Phe Leu Tyr Leu Ser Leu Glu Ile Ser Pro Gln Asn Val Asp
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Val Asn Val His Pro Thr Lys His Glu Val His Phe Leu His Glu Glu
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Ser Ser Thr Ser Gly Ser Ser Asp Lys Val Tyr Ala His Gln Met Val
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Arg Thr Asp Ser Arg Glu Gln Lys Leu Asp Ala Phe Leu Gln Pro Leu
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Leu Leu Ile Asp Asn Tyr Val Pro Pro Leu Glu Gly Leu Pro Ile Phe
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Gln Tyr Ile Ser Glu Glu Ser Thr Leu Ser Gly Gln Gln Ser Glu Val
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Pro Gly Ser Ile Pro Asn Ser Trp Lys Trp Thr Val Glu His Ile Val
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Tyr Lys Ala Leu Arg Ser His Ile Leu Pro Pro Lys His Phe Thr Glu
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    50   55   60

Asp Ala Pro Val Met Ala Met Lys Tyr Tyr Thr Ser Lys Ile Asn Ser
65   70   75   80

His Glu Asp Leu Glu Asn Leu Thr Thr Tyr Gly Phe Arg Gly Glu Ala
            85   90   95

Leu Gly Ser Ile Cys Cys Ile Ala Glu Val Leu Ile Thr Thr Arg Thr
            100   105   110

Ala Ala Asp Asn Phe Ser Thr Gln Tyr Val Leu Asp Gly Ser Gly His
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gacattctaa taggctgtga ggaagaggag caggaaaatg gcaaagccta ttgtgtgctt    3480

gttactggac caaatatggg gggcaagtct acgcttatga gacaggctgg cttattagct    3540

gtaatggccc agatgggttg ttacgtccct gctgaagtgt gcaggctcac accaattgat    3600

agagtgttta ctagacttgt tgcctcagac agaataatgt caggtgaaag tacatttttt    3660

gttgaattaa gtgaaactgc cagcatactc atgcatgcaa cagcacattc tctggtgctt    3720

gtggatgaat taggaagagg tactgcaaca tttgatggga cggcaaatagc aaatgcagtt    3780

gttaaagaac ttgctgagac tataaaatgt cgtacattat tttcaactca ctaccattca    3840

ttagtagaag attattctca aaatgttgct gtgcgcctag gacatatggc atgcatggta    3900

gaaaatgaat gtgaagaccc cagccaggag actattacgt tcctctataa attcattaag    3960

ggagcttgtc ctaaaagcta tggctttaat gcagcaaggc ttgctaatct cccagaggaa    4020

gttattcaaa agggacatag aaaagcaaga gaatttgaga agatgaatca gtcactacga    4080

ttatttcggg aagtttgcct ggctagtgaa aggtcaactg tagatgctga agctgtccat    4140

aaattgctga ctttgattaa ggaattatag actgactaca ttggaagctt tgagttgact    4200

tctgaccaaa ggtggtaaat tcagacaaca ttatgatcta ataaacttta ttttttaaaa    4260

atga                                                                  4264


<210>  16
<211>  1360
<212>  PRT
<213>  Homo sapiens

<400>  16

Met Ser Arg Gln Ser Thr Leu Tyr Ser Phe Phe Pro Lys Ser Pro Ala
1                5                   10                  15
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Leu Ser Asp Ala Asn Lys Ala Ser Ala Arg Ala Ser Arg Glu Gly Gly
        20                  25                  30

Arg Ala Ala Ala Ala Pro Gly Ala Ser Pro Ser Pro Gly Gly Asp Ala
        35                  40                  45

Ala Trp Ser Glu Ala Gly Pro Gly Pro Arg Pro Leu Ala Arg Ser Ala
    50                  55                  60

Ser Pro Pro Lys Ala Lys Asn Leu Asn Gly Gly Leu Arg Arg Ser Val
65                  70                  75                  80

Ala Pro Ala Ala Pro Thr Ser Cys Asp Phe Ser Pro Gly Asp Leu Val
            85                  90                  95

Trp Ala Lys Met Glu Gly Tyr Pro Trp Trp Pro Cys Leu Val Tyr Asn
            100                 105                 110

His Pro Phe Asp Gly Thr Phe Ile Arg Glu Lys Gly Lys Ser Val Arg
        115                 120                 125

Val His Val Gln Phe Phe Asp Asp Ser Pro Thr Arg Gly Trp Val Ser
        130                 135                 140

Lys Arg Leu Leu Lys Pro Tyr Thr Gly Ser Lys Ser Lys Glu Ala Gln
145                 150                 155                 160

Lys Gly Gly His Phe Tyr Ser Ala Lys Pro Glu Ile Leu Arg Ala Met
                165                 170                 175

Gln Arg Ala Asp Glu Ala Leu Asn Lys Asp Lys Ile Lys Arg Leu Glu
            180                 185                 190

Leu Ala Val Cys Asp Glu Pro Ser Glu Pro Glu Glu Glu Glu Glu Met
            195                 200                 205

Glu Val Gly Thr Thr Tyr Val Thr Asp Lys Ser Glu Glu Asp Asn Glu
        210                 215                 220

Ile Glu Ser Glu Glu Glu Val Gln Pro Lys Thr Gln Gly Ser Arg Arg
225                 230                 235                 240

Ser Ser Arg Gln Ile Lys Lys Arg Arg Val Ile Ser Asp Ser Glu Ser
                245                 250                 255

Asp Ile Gly Gly Ser Asp Val Glu Phe Lys Pro Asp Thr Lys Glu Glu
            260                 265                 270
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```
Gly Ser Ser Asp Glu Ile Ser Ser Gly Val Gly Asp Ser Glu Ser Glu
        275                 280                 285


Gly Leu Asn Ser Pro Val Lys Val Ala Arg Lys Arg Lys Arg Met Val
    290                 295                 300


Thr Gly Asn Gly Ser Leu Lys Arg Lys Ser Ser Arg Lys Glu Thr Pro
305                 310                 315                 320


Ser Ala Thr Lys Gln Ala Thr Ser Ile Ser Ser Glu Thr Lys Asn Thr
                325                 330                 335


Leu Arg Ala Phe Ser Ala Pro Gln Asn Ser Glu Ser Gln Ala His Val
            340                 345                 350


Ser Gly Gly Gly Asp Asp Ser Ser Arg Pro Thr Val Trp Tyr His Glu
            355                 360                 365


Thr Leu Glu Trp Leu Lys Glu Glu Lys Arg Arg Asp Glu His Arg Arg
    370                 375                 380


Arg Pro Asp His Pro Asp Phe Asp Ala Ser Thr Leu Tyr Val Pro Glu
385                 390                 395                 400


Asp Phe Leu Asn Ser Cys Thr Pro Gly Met Arg Lys Trp Trp Gln Ile
            405                 410                 415


Lys Ser Gln Asn Phe Asp Leu Val Ile Cys Tyr Lys Val Gly Lys Phe
            420                 425                 430


Tyr Glu Leu Tyr His Met Asp Ala Leu Ile Gly Val Ser Glu Leu Gly
        435                 440                 445


Leu Val Phe Met Lys Gly Asn Trp Ala His Ser Gly Phe Pro Glu Ile
    450                 455                 460


Ala Phe Gly Arg Tyr Ser Asp Ser Leu Val Gln Lys Gly Tyr Lys Val
465                 470                 475                 480


Ala Arg Val Glu Gln Thr Glu Thr Pro Glu Met Met Glu Ala Arg Cys
                485                 490                 495


Arg Lys Met Ala His Ile Ser Lys Tyr Asp Arg Val Val Arg Arg Glu
            500                 505                 510


Ile Cys Arg Ile Ile Thr Lys Gly Thr Gln Thr Tyr Ser Val Leu Glu
        515                 520                 525


                            Page 37
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Gly Asp Pro Ser Glu Asn Tyr Ser Lys Tyr Leu Leu Ser Leu Lys Glu
    530                 535                 540

Lys Glu Glu Asp Ser Ser Gly His Thr Arg Ala Tyr Gly Val Cys Phe
545                 550                 555                 560

Val Asp Thr Ser Leu Gly Lys Phe Phe Ile Gly Gln Phe Ser Asp Asp
                565                 570                 575

Arg His Cys Ser Arg Phe Arg Thr Leu Val Ala His Tyr Pro Pro Val
                580                 585                 590

Gln Val Leu Phe Glu Lys Gly Asn Leu Ser Lys Glu Thr Lys Thr Ile
                595                 600                 605

Leu Lys Ser Ser Leu Ser Cys Ser Leu Gln Glu Gly Leu Ile Pro Gly
    610                 615                 620

Ser Gln Phe Trp Asp Ala Ser Lys Thr Leu Arg Thr Leu Leu Glu Glu
625                 630                 635                 640

Glu Tyr Phe Arg Glu Lys Leu Ser Asp Gly Ile Gly Val Met Leu Pro
                645                 650                 655

Gln Val Leu Lys Gly Met Thr Ser Glu Ser Asp Ser Ile Gly Leu Thr
                660                 665                 670

Pro Gly Glu Lys Ser Glu Leu Ala Leu Ser Ala Leu Gly Gly Cys Val
    675                 680                 685

Phe Tyr Leu Lys Lys Cys Leu Ile Asp Gln Glu Leu Leu Ser Met Ala
    690                 695                 700

Asn Phe Glu Glu Tyr Ile Pro Leu Asp Ser Asp Thr Val Ser Thr Thr
705                 710                 715                 720

Arg Ser Gly Ala Ile Phe Thr Lys Ala Tyr Gln Arg Met Val Leu Asp
                725                 730                 735

Ala Val Thr Leu Asn Asn Leu Glu Ile Phe Leu Asn Gly Thr Asn Gly
                740                 745                 750

Ser Thr Glu Gly Thr Leu Leu Glu Arg Val Asp Thr Cys His Thr Pro
                755                 760                 765

Phe Gly Lys Arg Leu Leu Lys Gln Trp Leu Cys Ala Pro Leu Cys Asn
    770                 775                 780
```

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His Tyr Ala Ile Asn Asp Arg Leu Asp Ala Ile Glu Asp Leu Met Val
785                 790                 795                 800

Val Pro Asp Lys Ile Ser Glu Val Val Glu Leu Leu Lys Lys Leu Pro
                805                 810                 815

Asp Leu Glu Arg Leu Leu Ser Lys Ile His Asn Val Gly Ser Pro Leu
            820                 825                 830

Lys Ser Gln Asn His Pro Asp Ser Arg Ala Ile Met Tyr Glu Glu Thr
        835                 840                 845

Thr Tyr Ser Lys Lys Lys Ile Ile Asp Phe Leu Ser Ala Leu Glu Gly
    850                 855                 860

Phe Lys Val Met Cys Lys Ile Ile Gly Ile Met Glu Glu Val Ala Asp
865                 870                 875                 880

Gly Phe Lys Ser Lys Ile Leu Lys Gln Val Ile Ser Leu Gln Thr Lys
            885                 890                 895

Asn Pro Glu Gly Arg Phe Pro Asp Leu Thr Val Glu Leu Asn Arg Trp
            900                 905                 910

Asp Thr Ala Phe Asp His Glu Lys Ala Arg Lys Thr Gly Leu Ile Thr
        915                 920                 925

Pro Lys Ala Gly Phe Asp Ser Asp Tyr Asp Gln Ala Leu Ala Asp Ile
    930                 935                 940

Arg Glu Asn Glu Gln Ser Leu Leu Glu Tyr Leu Glu Lys Gln Arg Asn
945                 950                 955                 960

Arg Ile Gly Cys Arg Thr Ile Val Tyr Trp Gly Ile Gly Arg Asn Arg
            965                 970                 975

Tyr Gln Leu Glu Ile Pro Glu Asn Phe Thr Thr Arg Asn Leu Pro Glu
        980                 985                 990

Glu Tyr Glu Leu Lys Ser Thr Lys  Lys Gly Cys Lys Arg  Tyr Trp Thr
        995                 1000                1005

Lys Thr  Ile Glu Lys Lys Leu  Ala Asn Leu Ile Asn  Ala Glu Glu
    1010                1015                1020

Arg Arg  Asp Val Ser Leu Lys  Asp Cys Met Arg Arg  Leu Phe Tyr
    1025                1030                1035
```

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```
Asn Phe  Asp Lys Asn Tyr Lys  Asp Trp Gln Ser Ala  Val Glu Cys
    1040                1045                1050

Ile Ala  Val Leu Asp Val Leu  Leu Cys Leu Ala Asn  Tyr Ser Arg
    1055                1060                1065

Gly Gly  Asp Gly Pro Met Cys  Arg Pro Val Ile Leu  Leu Pro Glu
    1070                1075                1080

Asp Thr  Pro Pro Phe Leu Glu  Leu Lys Gly Ser Arg  His Pro Cys
    1085                1090                1095

Ile Thr  Lys Thr Phe Phe Gly  Asp Asp Phe Ile Pro  Asn Asp Ile
    1100                1105                1110

Leu Ile  Gly Cys Glu Glu Glu  Glu Gln Glu Asn Gly  Lys Ala Tyr
    1115                1120                1125

Cys Val  Leu Val Thr Gly Pro  Asn Met Gly Gly Lys  Ser Thr Leu
    1130                1135                1140

Met Arg  Gln Ala Gly Leu Leu  Ala Val Met Ala Gln  Met Gly Cys
    1145                1150                1155

Tyr Val  Pro Ala Glu Val Cys  Arg Leu Thr Pro Ile  Asp Arg Val
    1160                1165                1170

Phe Thr  Arg Leu Gly Ala Ser  Asp Arg Ile Met Ser  Gly Glu Ser
    1175                1180                1185

Thr Phe  Phe Val Glu Leu Ser  Glu Thr Ala Ser Ile  Leu Met His
    1190                1195                1200

Ala Thr  Ala His Ser Leu Val  Leu Val Asp Glu Leu  Gly Arg Gly
    1205                1210                1215

Thr Ala  Thr Phe Asp Gly Thr  Ala Ile Ala Asn Ala  Val Val Lys
    1220                1225                1230

Glu Leu  Ala Glu Thr Ile Lys  Cys Arg Thr Leu Phe  Ser Thr His
    1235                1240                1245

Tyr His  Ser Leu Val Glu Asp  Tyr Ser Gln Asn Val  Ala Val Arg
    1250                1255                1260

Leu Gly  His Met Ala Cys Met  Val Glu Asn Glu Cys  Glu Asp Pro
    1265                1270                1275
```

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```
Ser Gln  Glu Thr Ile Thr Phe  Leu Tyr Lys Phe  Ile  Lys Gly Ala
    1280             1285              1290

Cys Pro  Lys Ser Tyr Gly Phe  Asn Ala Ala Arg  Leu  Ala Asn Leu
    1295             1300              1305

Pro Glu  Glu Val Ile Gln Lys  Gly His Arg Lys  Ala  Arg Glu Phe
    1310             1315              1320

Glu Lys  Met Asn Gln Ser Leu  Arg Leu Phe Arg  Glu  Val Cys Leu
    1325             1330              1335

Ala Ser  Glu Arg Ser Thr Val  Asp Ala Glu Ala  Val  His Lys Leu
    1340             1345              1350

Leu Thr  Leu Ile Lys Glu Leu
    1355             1360


<210>  17
<211>  1408
<212>  DNA
<213>  Homo sapiens

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ggctttacct ggtacatcgg catggcgcaa ccaaagcaag agagggtggc gcgtgccaga     180

caccaacggt cggaaaccgc cagacaccaa cggtcggaaa ccgccaagac accaacgctc     240

ggaaaccgcc agacaccaac gctcggaaac cgccagacac caaggctcgg aatccacgcc     300

aggccacgac ggagggcgac tacctccctt ctgaccctgc tgctggcgtt cggaaaaaac     360

gcagtccggt gtgctctgat tggtccaggc tctttgacgt cacggactcg acctttgaca     420

gagccactag gcgaaaagga gagacgggaa gtattttttc cgccccgccc ggaaagggtg     480

gagcacaacg tcgaaagcag ccgttgggag cccaggaggc ggggcgcctg tgggagccgt     540

ggagggaact ttcccagtcc ccgaggcgga tccggtgttg catccttgga gcgagctgag     600

aactcgagta cagaacctgc taaggccatc aaacctattg atcggaagtc agtccatcag     660

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aacagtctgg atgctggtgc cactaatgtt gatctaaagc ttaaggacta tggagtggat     780

ctcattgaag tttcaggcaa tggatgtggg gtagaagaag aaaacttcga aggctttact     840

ctgaaacatc acacatgtaa gattcaagag tttgccgacc taactcaggt ggaaactttt     900

ggctttcggg gggaagctct gagctcactt tgtgcactga gtgatgtcac catttctacc     960

tgccgtgtat cagcgaaggt tgggactcga ctggtgtttg atcactatgg gaaaatcatc    1020
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cagaaaaccc cctaccccg ccccagaggg atgacagtca gcgtgaagca attattttct   1080

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cccttcgcct tctgccgtga ttgtcagttt cctgaggcct ccccagccat gcttcctgta   1200

cagcctgtag aactgactcc tagaagtacc ccaccccacc cctgctcctt ggaggacaac   1260

gtgatcactg tattcagctc tgtcaagaat ggtccaggtt cttctagatg atctgcacaa   1320

atggttcctc tcctccttcc tgatgtctgc cattagcatt ggaataaagt tcctgctgaa   1380

aatccaaaaa aaaaaaaaaa aaaaaaaa                                      1408
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<210> 18
<211> 389
<212> PRT
<213> Homo sapiens

<400> 18

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Met Ala Gln Pro Lys Gln Glu Arg Val Ala Arg Ala Arg His Gln Arg
1               5                   10                  15

Ser Glu Thr Ala Arg His Gln Arg Ser Glu Thr Ala Lys Thr Pro Thr
            20                  25                  30

Leu Gly Asn Arg Gln Thr Pro Thr Leu Gly Asn Arg Gln Thr Pro Arg
        35                  40                  45

Leu Gly Ile His Ala Arg Pro Arg Arg Arg Ala Thr Thr Ser Leu Leu
    50                  55                  60

Thr Leu Leu Leu Ala Phe Gly Lys Asn Ala Val Arg Cys Ala Leu Ile
65                  70                  75                  80

Gly Pro Gly Ser Leu Thr Ser Arg Thr Arg Pro Leu Thr Glu Pro Leu
                85                  90                  95

Gly Glu Lys Glu Arg Arg Glu Val Phe Phe Pro Arg Pro Glu Arg
            100                 105                 110

Val Glu His Asn Val Glu Ser Ser Arg Trp Glu Pro Arg Arg Arg Gly
        115                 120                 125

Ala Cys Gly Ser Arg Gly Gly Asn Phe Pro Ser Pro Arg Gly Gly Ser
    130                 135                 140

Gly Val Ala Ser Leu Glu Arg Ala Glu Asn Ser Ser Thr Glu Pro Ala
145                 150                 155                 160

Lys Ala Ile Lys Pro Ile Asp Arg Lys Ser Val His Gln Ile Cys Ser
```

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Gly Pro Val Val Pro Ser Leu Arg Pro Asn Ala Val Lys Glu Leu Val
            180   185   190

Glu Asn Ser Leu Asp Ala Gly Ala Thr Asn Val Asp Leu Lys Leu Lys
        195   200   205

Asp Tyr Gly Val Asp Leu Ile Glu Val Ser Gly Asn Gly Cys Gly Val
    210   215   220

Glu Glu Glu Asn Phe Glu Gly Phe Thr Leu Lys His His Thr Cys Lys
225   230   235   240

Ile Gln Glu Phe Ala Asp Leu Thr Gln Val Glu Thr Phe Gly Phe Arg
            245   250   255

Gly Glu Ala Leu Ser Ser Leu Cys Ala Leu Ser Asp Val Thr Ile Ser
            260   265   270

Thr Cys Arg Val Ser Ala Lys Val Gly Thr Arg Leu Val Phe Asp His
        275   280   285

Tyr Gly Lys Ile Ile Gln Lys Thr Pro Tyr Pro Arg Pro Arg Gly Met
    290   295   300

Thr Val Ser Val Lys Gln Leu Phe Ser Thr Leu Pro Val His His Lys
305   310   315   320

Glu Phe Gln Arg Asn Ile Lys Lys Lys Arg Ala Cys Phe Pro Phe Ala
            325   330   335

Phe Cys Arg Asp Cys Gln Phe Pro Glu Ala Ser Pro Ala Met Leu Pro
            340   345   350

Val Gln Pro Val Glu Leu Thr Pro Arg Ser Thr Pro Pro His Pro Cys
        355   360   365

Ser Leu Glu Asp Asn Val Ile Thr Val Phe Ser Ser Val Lys Asn Gly
    370   375   380

Pro Gly Ser Ser Arg
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<210>   19
<211>   1785
<212>   DNA
<213>   Homo sapiens

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gggagctgca gaccagtctt ccgtggcagg ctgagcgctc cagtcttcag tagggaattg   180

ctgaataggc acagagggca cctgtacacc ttcagaccag tctgcaacct caggctgagt   240

agcagtgaac tcaggagcgg gagcagtcca ttcacctga aattcctcct tggtcactgc   300

cttctcagca gcagcctgct cttctttttc aatctcttca ggatctctgt agaagtacag   360

atcaggcatg acctcccatg ggtgttcacg ggaaatggtg ccacgcatgc gcagaacttc   420

ccgagccagc atccaccaca ttaaacccac tgagtgagct cccttgttgt tgcatgggat   480

ggcaatgtcc acatagcgca gaggagaatc tgtgttacac agcgcaatgg taggtaggtt   540

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gtccttggcg gcctagacta ggccgtcgct gtatggtgag cccaggag gcggatctgg     660

gcccccagaa ggacaccgc ctggatttgc cccgtagccc ggccggggc cctcgggagc     720

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accctgatga gaagatagca tacggggatg tgatgttgga gaactacagc catctagttt  1020

ctgtggggta tgattatcac caagccaaac atcatcatg agtggaggtg aaggaagtgg    1080

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cacacatgta agattcaaga gtttgccgac ctaactgaag ttgaaacttt cggtttcag    1440

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ccctaccccc accccagagg gaccacagtc agcgtgaagc agttattttc tacgctacct   1620

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<212> PRT
<213> Homo sapiens

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1   5   10   15

Arg Glu Ala Asp Leu Gly Pro Gln Lys Asp Thr Arg Leu Asp Leu Pro
            20   25   30

Arg Ser Pro Ala Arg Ala Pro Arg Glu Gln Asn Ser Leu Gly Glu Val
        35   40   45

Asp Arg Arg Gly Pro Arg Glu Gln Thr Arg Ala Pro Ala Thr Ala Ala
    50   55   60

Pro Pro Arg Pro Leu Gly Ser Arg Gly Ala Glu Ala Ala Glu Pro Gln
65   70   75   80

Glu Gly Leu Ser Ala Thr Val Ser Ala Cys Phe Gln Glu Gln Gln Glu
                85   90   95

Met Asn Thr Leu Gln Gly Pro Val Ser Phe Lys Asp Val Ala Val Asp
            100   105   110

Phe Thr Gln Glu Glu Trp Arg Gln Leu Asp Pro Asp Glu Lys Ile Ala
        115   120   125

Tyr Gly Asp Val Met Leu Glu Asn Tyr Ser His Leu Val Ser Val Gly
    130   135   140

Tyr Asp Tyr His Gln Ala Lys His His His Gly Val Glu Val Lys Glu
145   150   155   160

Val Glu Gln Gly Glu Glu Pro Trp Ile Met Glu Gly Glu Phe Pro Cys
                165   170   175

Gln His Ser Pro Glu Pro Ala Lys Ala Ile Lys Pro Ile Asp Arg Lys
            180   185   190

Ser Val His Gln Ile Cys Ser Gly Pro Val Val Leu Ser Leu Ser Thr
        195   200   205

Ala Val Lys Glu Leu Val Glu Asn Ser Leu Asp Ala Gly Ala Thr Asn
    210   215   220

Ile Asp Leu Lys Leu Lys Asp Tyr Gly Val Asp Leu Ile Glu Val Ser
225   230   235   240

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Asp Asn Gly Cys Gly Val Glu Glu Glu Asn Phe Gly Leu Ile Ser
                245   250   255

Phe Ser Ser Glu Thr Ser His Met
                260

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<212> DNA
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gcgacagcag ccccgccccg gcctctcggg agcgggggg cagaggctgc ggagccccag   240

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gaacctgcta aggccatcaa acctattgat cggaagtcag tccatcagat ttgctctggg   600

ccagtggtac tgagtctaca cactgcagtg aaggagttag tagaaaacag tctggatgct   660

ggtgccacta atattgatct aaagcttaag gactatggag tggatctcat tgaagtttca   720

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<210> 22
<211> 264
<212> PRT
<213> Homo sapiens

<400> 22

Met Cys Pro Trp Arg Pro Arg Leu Gly Arg Arg Cys Met Val Ser Pro
1   5   10   15

Arg Glu Ala Asp Leu Gly Pro Gln Lys Asp Thr Arg Leu Asp Leu Pro
                20   25   30

Arg Ser Pro Ala Arg Ala Pro Arg Glu Gln Asn Ser Leu Gly Glu Val
        35   40   45

Asp Arg Arg Gly Pro Arg Glu Gln Thr Arg Ala Pro Ala Thr Ala Ala

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Pro Pro Arg Pro Leu Gly Ser Arg Gly Ala Glu Ala Ala Glu Pro Gln
65   70   75   80

Glu Gly Leu Ser Ala Thr Val Ser Ala Cys Phe Gln Glu Gln Gln Glu
                  85   90   95

Met Asn Thr Leu Gln Gly Pro Val Ser Phe Lys Asp Val Ala Val Asp
              100   105   110

Phe Thr Gln Glu Glu Trp Arg Gln Leu Asp Pro Asp Glu Lys Ile Ala
          115   120   125

Tyr Gly Asp Val Met Leu Glu Asn Tyr Ser His Leu Val Ser Val Gly
      130   135   140

Tyr Asp Tyr His Gln Ala Lys His His His Gly Val Glu Val Lys Glu
145   150   155   160

Val Glu Gln Gly Glu Glu Pro Trp Ile Met Glu Gly Glu Phe Pro Cys
                  165   170   175

Gln His Ser Pro Glu Pro Ala Lys Ala Ile Lys Pro Ile Asp Arg Lys
              180   185   190

Ser Val His Gln Ile Cys Ser Gly Pro Val Val Leu Ser Leu Ser Thr
          195   200   205

Ala Val Lys Glu Leu Val Glu Asn Ser Leu Asp Ala Gly Ala Thr Asn
      210   215   220

Ile Asp Leu Lys Leu Lys Asp Tyr Gly Val Asp Leu Ile Glu Val Ser
225   230   235   240

Asp Asn Gly Cys Gly Val Glu Glu Glu Asn Phe Glu Gly Leu Ile Ser
              245   250   255

Phe Ser Ser Glu Thr Ser His Met
              260

<210> 23
<211> 30
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<213> Artificial Sequence

<220>
<223> synthetic oligonucleotide primer

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<212>  DNA
<213>  Artificial Sequence

<220>
<223>  synthetic oligonucleotide primer

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aaccttcgcc gatgc                                                     75


<210>  25
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<212>  DNA
<213>  Artificial Sequence

<220>
<223>  synthetic oligonucleotide primer

<400>  25
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<210>  26
<211>  75
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  synthetic oligonucleotide primer

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gaattcttat tacgtagaat cgagaccgag gagagggtta gggataggct tacccatgtg    60

tgatgtttca gagct                                                     75


<210>  27
<211>  49
<212>  DNA
<213>  Artificial Sequence

<220>
<223>  synthetic oligonucleotide primer

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<223>  corresponds to the first nucleotide of the first codon of the tar
       get mismatch repair gene


<220>
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<222>  (36)..(36)
<223>  corresponds to the second nucleotide of the first codon of the ta
       rget mismatch repair gene
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<221>  mⁱˢc_feature
<222>  (37)..(37)
<223>  corresponds to the third nucleotide of the first codon of the tar
       get mismatch repair gene


<220>
<221>  misc_feature
<222>  (38)..(38)
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       rget mismatch repair gene


<220>
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       arget mismatch repair gene


<220>
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       rget mismatch repair gene


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       get mismatch repair gene


<220>
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       rget mismatch repair gene


<220>
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<220>
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       rget mismatch repair gene


<220>
<221>  misc_feature
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       arget mismatch repair gene
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<223> corresponds to the third nucleotide of the fourth codon of the ta
rget mismatch repair gene

<220>
<221> misc_feature
<222> (47)..(47)
<223> corresponds to the first nucleotide of the fifth codon of the tar
get mismatch repair gene

<220>
<221> misc_feature
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<223> corresponds to the second nucleotide of the fifth codon of the ta
rget mismatch repair gene

<220>
<221> misc_feature
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get mismatch repair gene

<400> 27
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<210> 28
<211> 4290
<212> DNA
<213> Homo sapiens

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tccttgggcc aatgtgttga ggaacttgcc ctcaacagta ttgatgctga agcaaaatgt   120

gtggctgtca gggtgaatat ggaaaccttc caagttcaag tgatagacaa tggatttggg   180

atggggagtg atgatgtaga gaaagtggga aatcgttatt tcaccagtaa atgccactcg   240

gtacaggact tggagaatcc aaggttttat ggttccgag gagaggcctt ggcaaatatt   300

gctgacatgg ccagtgctgt ggaaatttcg tccaagaaaa acaggacaat gaaaactttt   360

gtgaaactgt ttcagagtgg aaaagccctg aaagcttgtg aagctgatgt gactagagca   420

agcgctggga ctactgtaac agtgtataac ctatttttac cagcttcctgt aaggaggaaa   480

tgcatggacc ctagactgga gtttgagaag gttaggcaga aatagaagc tctctcactc   540

atgcacccct ccatttcttt ctctttgaga aatgatgtttt ctggttccat ggttcttcag   600

ctccctaaaa ccaaagacgt atgttcccga ttttgtcaaa tttatggatt gggaaagtcc   660

caaaagctaa gagaaataag ttttaaatat aaagagtttg agcttagtcg ctatatcagc   720

tctgaagcac attacaacaa gaatatgcag tttttgtttg tgaacaaaag actagtttta   780

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```
aggacaaagc tacataaact cattgacttt ttattaagga aagaaagtat tatatgcaag      840

ccaaagaatg gtcccaccag taggcr itg aattcaagtc ttcggcaccg gtctaccoca      900

gaactctatg gcatatatgt aattaatgtg cagtgccaat tctgtgagta tgatgtgtgc      960

atggagccag ccaaaactct gattgaattt cagaactggg acactctctt gttttgcatt     1020

caggaaggag tgaaaatgtt tttaaagcaa gaaaaattat ttgtggaatt atcaggtgag     1080

gatattaagg aatttagtga agataatggt tttagtttat ttgatgctac tcttcagaag     1140

cgtgtgactt ccgatgagag gagcaatttc caggaagcat gtaataatat tttagattcc     1200

tatgagatgt ttaatttgca gtcaaaagct gtgaaaagaa aaactactgc agaaaacgta     1260

aacacacaga gttctaggga ttcagaagct accagaaaaa atacaaatga tgcatttttg     1320

tacatttatg aatcaggtgg tccaggccat agcaaaatga cagagccatc tttacaaaac     1380

aaagacagct cttgctcaga atcaaagatg ttagaacaag agacaattgt agcatcagaa     1440

gctggagaaa atgagaaaca taaaaaatct ttcctggaac atagctcttt agaaaatccg     1500

tgtggaacca gtttagaaat gtttttaagc ccttttcaga caccatgtca ctttgaggag     1560

agtgggcagg atctagaaat atggaaagaa agtactactg ttaatggcat ggctgccaac     1620

atcttgaaaa ataatagaat tcagaatcaa ccaaagagat ttaaagatgc tactgaagtg     1680

ggatgccagc ctctgccttt tgcaacaaca ttatggggag tacatagtgc tcagacagag     1740

aaagagaaaa aaaaagaatc tagcaattgt ggaagaagaa atgtttttag ttatgggcga     1800

gttaaattat gttccactgg ctttataact catgtagtac aaaatgaaaa aactaaatca     1860

actgaaacag aacattcatt taaaaattat gttagacctg gtcccacacg tgcccaagaa     1920

acatttggaa atagaacacg tcattcagtt gaaactccag acatcaaaga tttagccagc     1980

actttaagta aagaatctgg tcaattgccc aacaaaaaaa attgcagaac gaatataagt     2040

tatgggctag agaatgaacc tacagcaact tatacaatgt tttctgcttt tcaggaaggt     2100

agcaaaaaat cacaaacaga ttgcatatta tctgatacat ccccctcttt ccctggtat      2160

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gtccgtaaga agctaagctt gagttcacag ctaggatctt tagagaagtt taagaggcaa     2280

tatgggaagg ttgaaaatcc tctggataca gaagtagagg aaagtaatgg agtcactacc     2340

aatctcagtc ttcaagttga acctgacatt ctgctgaagg acaagaaccg cttagagaac     2400

tctgatgttt gtaaaatcac tactatggag catagtgatt cagatagtag ttgtcaacca     2460

gcaagccaca tccttgactc agagaagttt ccattctcca aggatgaaga ttgtttagaa     2520

caacagatgc ttagtttgag agaaagtcct atgaccctga aggagttatc tctctttaat     2580

agaaaacctt tggaccttga gaagtcatct gaatcactag cctctaaatt atccagactg     2640

aagggttccg aaagagaaac tcaaacaatg gggatgatga gtcgttttaa tgaacttcca     2700
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```
aattcagatt ccagtaggaa agacagcaag ttgtgcagtg tgttaacaca agatttttgt    2760

atgttattta acaacaagca tgaaaaaaca gagaa tgtg tcatcccaac atcagattct    2820

gccacacagg ataattcctt taataaaaat agtaaaaac attctaacag caatacaaca    2880

gagaactgtg tgatatcaga aactcctttg gtattgccct ataataattc taaagttacc    2940

ggtaaagatt cagatgttct tatcagagcc tcagaacaac agataggaag tcttgactct    3000

cccagtggaa tgttaatgaa tccggtagaa gatgccacag gtgaccaaaa tggaatttgt    3060

tttcagagtg aggaatctaa agcaagagct tgttctgaaa ctgaagagtc aaacacgtgt    3120

tgttcagatt ggcagcggca tttcgatgta gccctgggaa gaatggttta tgtcaacaaa    3180

atgactggac tcagcacatt cattgcccca actgaggaca ttcaggctgc ttgtactaaa    3240

gacctgacaa ctgtggctgt ggatgttgta cttgagaatg ggtctcagta caggtgtcaa    3300

ccttttagaa gcgaccttgt tcttcctttc cttccgagag ctcgagcaga gaggactgtg    3360

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agcagtggcc aggctgagag cttagcagtt aaaattcaca acatcttgta tccctatcgt    3540

ttcaccaaag gaatgattca ttcaatgcag gttctccagc aagtagataa caagtttatt    3600

gcctgtttga tgagcactaa gactgaagag aatggcgagg cagattccta cgagaagcaa    3660

caggcacaag gctctggtcg gaaaaaaatta ctgtcttcta ctctaattcc tccgctagag    3720

ataacagtga cagaggaaca aaggagactc ttatggtgtt accacaaaaa tctggaagat    3780

ctgggccttg aatttgtatt tccagacact agtgattctc tggtccttgt gggaaaagta    3840

ccactatgtt ttgtggaaag agaagccaat gaacttcgga gaggaagatc tactgtgacc    3900

aagagtattg tggaggaatt tatccgagaa caactggagc tactccagac caccggaggc    3960

atccaaggga cattggccact gactgtccag aaggtgttgg catcccaagc ctgccatggg    4020

gccattaagt ttaatgatga cctgagcatta caggaaagtt gccgccttat tgaagctctg    4080

tcctcatgcc agctgccatt ccagtgtgct cacgggagac cttctatgct gccgttagct    4140

gacatagacc acttggaaca ggaaaaacag attaaaccca acctcactaca acttcgcaaa    4200

atggcccagg cctggcgtct ctttggaaaa gcagagtgtg atacaaggca gagcctgcag    4260

caatccatgc ctccctgtga gccaccatga                                     4290


<210>    29
<211>    1429
<212>    PRT
<213>    Homo sapiens

<400>    29

Met Ile Lys Cys Leu Ser Val Glu Val Gln Ala Lys Leu Arg Ser Gly
1               5                   10                  15
```

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Leu Ala Ile Ser Ser Leu Gly Gln Cys Val Glu Glu Leu Ala Leu Asn
            20              25              30

Ser Ile Asp Ala Glu Ala Lys Cys Val Ala Val Arg Val Asn Met Glu
            35              40              45

Thr Phe Gln Val Gln Val Ile Asp Asn Gly Phe Gly Met Gly Ser Asp
        50              55              60

Asp Val Glu Lys Val Gly Asn Arg Tyr Phe Thr Ser Lys Cys His Ser
65              70              75              80

Val Gln Asp Leu Glu Asn Pro Arg Phe Tyr Gly Phe Arg Gly Glu Ala
                85              90              95

Leu Ala Asn Ile Ala Asp Met Ala Ser Ala Val Glu Ile Ser Ser Lys
            100             105             110

Lys Asn Arg Thr Met Lys Thr Phe Val Lys Leu Phe Gln Ser Gly Lys
        115             120             125

Ala Leu Lys Ala Cys Glu Ala Asp Val Thr Arg Ala Ser Ala Gly Thr
    130             135             140

Thr Val Thr Val Tyr Asn Leu Phe Tyr Gln Leu Pro Val Arg Arg Lys
145             150             155             160

Cys Met Asp Pro Arg Leu Glu Phe Glu Lys Val Arg Gln Arg Ile Glu
            165             170             175

Ala Leu Ser Leu Met His Pro Ser Ile Ser Phe Ser Leu Arg Asn Asp
            180             185             190

Val Ser Gly Ser Met Val Leu Gln Leu Pro Lys Thr Lys Asp Val Cys
        195             200             205

Ser Arg Phe Cys Gln Ile Tyr Gly Leu Gly Lys Ser Gln Lys Leu Arg
    210             215             220

Glu Ile Ser Phe Lys Tyr Lys Glu Phe Glu Leu Ser Gly Tyr Ile Ser
225             230             235             240

Ser Glu Ala His Tyr Asn Lys Asn Met Gln Phe Leu Phe Val Asn Lys
            245             250             255

Arg Leu Val Leu Arg Thr Lys Leu His Lys Leu Ile Asp Phe Leu Leu
            260             265             270
```

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```
Arg Lys Glu Ser Ile Ile Cys Lys Pro Lys Asn Gly Pro Thr Ser Arg
        275                 280                 285

Gln Met Asn Ser Ser Leu Arg His Arg Ser Thr Pro Glu Leu Tyr Gly
        290                 295                 300

Ile Tyr Val Ile Asn Val Gln Cys Gln Phe Cys Glu Tyr Asp Val Cys
305                 310                 315                 320

Met Glu Pro Ala Lys Thr Leu Ile Glu Phe Gln Asn Trp Asp Thr Leu
                325                 330                 335

Leu Phe Cys Ile Gln Glu Gly Val Lys Met Phe Leu Lys Gln Glu Lys
                340                 345                 350

Leu Phe Val Glu Leu Ser Gly Glu Asp Ile Lys Glu Phe Ser Glu Asp
        355                 360                 365

Asn Gly Phe Ser Leu Phe Asp Ala Thr Leu Gln Lys Arg Val Thr Ser
        370                 375                 380

Asp Glu Arg Ser Asn Phe Gln Glu Ala Cys Asn Asn Ile Leu Asp Ser
385                 390                 395                 400

Tyr Glu Met Phe Asn Leu Gln Ser Lys Ala Val Lys Arg Lys Thr Thr
                405                 410                 415

Ala Glu Asn Val Asn Thr Gln Ser Ser Arg Asp Ser Glu Ala Thr Arg
                420                 425                 430

Lys Asn Thr Asn Asp Ala Phe Leu Tyr Ile Tyr Glu Ser Gly Gly Pro
        435                 440                 445

Gly His Ser Lys Met Thr Glu Pro Ser Leu Gln Asn Lys Asp Ser Ser
        450                 455                 460

Cys Ser Glu Ser Lys Met Leu Glu Gln Glu Thr Ile Val Ala Ser Glu
465                 470                 475                 480

Ala Gly Glu Asn Glu Lys His Lys Lys Ser Phe Leu Glu His Ser Ser
                485                 490                 495

Leu Glu Asn Pro Cys Gly Thr Ser Leu Glu Met Phe Leu Ser Pro Phe
                500                 505                 510

Gln Thr Pro Cys His Phe Glu Glu Ser Gly Gln Asp Leu Glu Ile Trp
        515                 520                 525
```

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Lys Glu Ser Thr Thr Val Asn Gly Met Ala Ala Asn Ile Leu Lys Asn
    530                 535                 540

Asn Arg Ile Gln Asn Gln Pro Lys Arg Phe Lys Asp Ala Thr Glu Val
545                 550                 555                 560

Gly Cys Gln Pro Leu Pro Phe Ala Thr Thr Leu Trp Gly Val His Ser
                565                 570                 575

Ala Gln Thr Glu Lys Glu Lys Lys Glu Ser Ser Asn Cys Gly Arg
                580                 585                 590

Arg Asn Val Phe Ser Tyr Gly Arg Val Lys Leu Cys Ser Thr Gly Phe
                595                 600                 605

Ile Thr His Val Val Gln Asn Glu Lys Thr Lys Ser Thr Glu Thr Glu
    610                 615                 620

His Ser Phe Lys Asn Tyr Val Arg Pro Gly Pro Thr Arg Ala Gln Glu
625                 630                 635                 640

Thr Phe Gly Asn Arg Thr Arg His Ser Val Glu Thr Pro Asp Ile Lys
                645                 650                 655

Asp Leu Ala Ser Thr Leu Ser Lys Glu Ser Gly Gln Leu Pro Asn Lys
                660                 665                 670

Lys Asn Cys Arg Thr Asn Ile Ser Tyr Gly Leu Glu Asn Glu Pro Thr
            675                 680                 685

Ala Thr Tyr Thr Met Phe Ser Ala Phe Gln Glu Gly Ser Lys Lys Ser
    690                 695                 700

Gln Thr Asp Cys Ile Leu Ser Asp Thr Ser Pro Ser Phe Pro Trp Tyr
705                 710                 715                 720

Arg His Val Ser Asn Asp Ser Arg Lys Thr Asp Lys Leu Ile Gly Phe
                725                 730                 735

Ser Lys Pro Ile Val Arg Lys Lys Leu Ser Leu Ser Ser Gln Leu Gly
            740                 745                 750

Ser Leu Glu Lys Phe Lys Arg Gln Tyr Gly Lys Val Glu Asn Pro Leu
            755                 760                 765

Asp Thr Glu Val Glu Glu Ser Asn Gly Val Thr Thr Asn Leu Ser Leu
    770                 775                 780
```

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```
Gln Val Glu Pro Asp Ile Leu Leu Lys Asp Lys Asn Arg Leu Glu Asn
785             790             795                         800

Ser Asp Val Cys Lys Ile Thr Thr Met Glu His Ser Asp Ser Asp Ser
                805             810                 815

Ser Cys Gln Pro Ala Ser His Ile Leu Asp Ser Glu Lys Phe Pro Phe
            820             825             830

Ser Lys Asp Glu Asp Cys Leu Glu Gln Gln Met Leu Ser Leu Arg Glu
        835             840             845

Ser Pro Met Thr Leu Lys Glu Leu Ser Leu Phe Asn Arg Lys Pro Leu
    850             855             860

Asp Leu Glu Lys Ser Ser Glu Ser Leu Ala Ser Lys Leu Ser Arg Leu
865             870             875                         880

Lys Gly Ser Glu Arg Glu Thr Gln Thr Met Gly Met Met Ser Arg Phe
            885             890                 895

Asn Glu Leu Pro Asn Ser Asp Ser Ser Arg Lys Asp Ser Lys Leu Cys
        900             905             910

Ser Val Leu Thr Gln Asp Phe Cys Met Leu Phe Asn Asn Lys His Glu
        915             920             925

Lys Thr Glu Asn Gly Val Ile Pro Thr Ser Asp Ser Ala Thr Gln Asp
    930             935             940

Asn Ser Phe Asn Lys Asn Ser Lys Thr His Ser Ser Asn Thr Thr
945             950             955             960

Glu Asn Cys Val Ile Ser Glu Thr Pro Leu Val Leu Pro Tyr Asn Asn
            965             970             975

Ser Lys Val Thr Gly Lys Asp Ser Asp Val Leu Ile Arg Ala Ser Glu
        980             985             990

Gln Gln Ile Gly Ser Leu Asp Ser  Pro Ser Gly Met Leu  Met Asn Pro
        995             1000            1005

Val Glu  Asp Ala Thr Gly Asp  Gln Asn Gly Ile Cys  Phe Gln Ser
    1010            1015            1020

Glu Glu  Ser Lys Ala Arg Ala  Cys Ser Glu Thr Glu  Glu Ser Asn
    1025            1030            1035
```

```
Thr Cys  Cys Ser Asp Trp Gln  Arg His Phe Asp Val  Ala Leu Gly
    1040                 1045             1050

Arg Met  Val Tyr Val Asn Lys  Met Thr Gly Leu Ser  Thr Phe Ile
    1055                 1060             1065

Ala Pro  Thr Glu Asp Ile Gln  Ala Ala Cys Thr Lys  Asp Leu Thr
    1070                 1075             1080

Thr Val  Ala Val Asp Val Val  Leu Glu Asn Gly Ser  Gln Tyr Arg
    1085                 1090             1095

Cys Gln  Pro Phe Arg Ser Asp  Leu Val Leu Pro Phe  Leu Pro Arg
    1100                 1105             1110

Ala Arg  Ala Glu Arg Thr Val  Met Arg Gln Asp Asn  Arg Asp Thr
    1115                 1120             1125

Val Asp  Asp Thr Val Ser Ser  Glu Ser Leu Gln Ser  Leu Phe Ser
    1130                 1135             1140

Glu Trp  Asp Asn Pro Val Phe  Ala Arg Tyr Pro Glu  Val Ala Val
    1145                 1150             1155

Asp Val  Ser Ser Gly Gln Ala  Glu Ser Leu Ala Val  Lys Ile His
    1160                 1165             1170

Asn Ile  Leu Tyr Pro Tyr Arg  Phe Thr Lys Gly Met  Ile His Ser
    1175                 1180             1185

Met Gln  Val Leu Gln Gln Val  Asp Asn Lys Phe Ile  Ala Cys Leu
    1190                 1195             1200

Met Ser  Thr Lys Thr Glu Glu  Asn Gly Glu Ala Asp  Ser Tyr Glu
    1205                 1210             1215

Lys Gln  Gln Ala Gln Gly Ser  Gly Arg Lys Lys Leu  Leu Ser Ser
    1220                 1225             1230

Thr Leu  Ile Pro Pro Leu Glu  Ile Thr Val Thr Glu  Glu Gln Arg
    1235                 1240             1245

Arg Leu  Leu Trp Cys Tyr His  Lys Asn Leu Glu Asp  Leu Gly Leu
    1250                 1255             1260

Glu Phe  Val Phe Pro Asp Thr  Ser Asp Ser Leu Val  Leu Val Gly
    1265                 1270             1275
```

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```
Lys Val  Pro Leu Cys Phe Val  Glu Arg Glu Ala Asn  Glu Leu Arg
    1280              1285              1290

Arg Gly  Arg Ser Thr Val Thr  Lys Ser Ile Val Glu  Glu Phe Ile
    1295              1300              1305

Arg Glu  Gln Leu Glu Leu Leu  Gln Thr Thr Gly Gly  Ile Gln Gly
    1310              1315              1320

Thr Leu  Pro Leu Thr Val Gln  Lys Val Leu Ala Ser  Gln Ala Cys
    1325              1330              1335

His Gly  Ala Ile Lys Phe Asn  Asp Gly Leu Ser Leu  Gln Glu Ser
    1340              1345              1350

Cys Arg  Leu Ile Glu Ala Leu  Ser Ser Cys Gln Leu  Pro Phe Gln
    1355              1360              1365

Cys Ala  His Gly Arg Pro Ser  Met Leu Pro Leu Ala  Asp Ile Asp
    1370              1375              1380

His Leu  Glu Gln Glu Lys Gln  Ile Lys Pro Asn Leu  Thr Lys Leu
    1385              1390              1395

Arg Lys  Met Ala Gln Ala Trp  Arg Leu Phe Gly Lys  Ala Glu Cys
    1400              1405              1410

Asp Thr  Arg Gln Ser Leu Gln  Gln Ser Met Pro Pro  Cys Glu Pro
    1415              1420              1425

Pro
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ggagaagcct tgagctctct ctgtgcattg ggaaatctca ctgtggaaac aagaacaaag    420

aatgagccag ttgctacgct cttgacgttt gatcattctg gtttgcttac tgctgaaaag    480

aagactgctc gccaaattgg taccactgtc actgttagga agttgttctc taatttacct    540

gtacgaagca aagagtttaa gcggaatata cgcaaagaat atgggaagct tgtatcttta    600

ttgaacgcat atgcgcttat tgcgaaagga gtgcggtttg tctgctctaa cacgactggg    660

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tccagtaatg cgtcttatat tgttaatagg ttcgaggaga attcggagca accagataag   1080

gctggagttt cgtcgtttca gaagaaatca aatctttgt cagaagggat agttctggat   1140

gtcagttcta aaacaagact aggggaagct attgagaaag aaaatccatc cttaagggag   1200

gttgaaattg ataatagttc gccaatggag aagtttaagt ttgagatcaa ggcatgtggg   1260

acgaagaaag gggaaggttc tttatcagtc catgatgtaa ctcaccttga caagacacct   1320

agcaaaggtt tgcctcagtt aaatgtgact gagaaagtta ctgatgcaag taaagacttg   1380

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agttatcgtg tggagaaaag caaatttgaa gttcgtgcct tagcttcaag gtgtctcgtg   1560

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gaagtaactg tgttaatgca catggatatt atcagggaaa atggctttct tctagaggag   1920

aatccaagtg ctcctcccgg aaaaacacttt agactacgag ccattcctta tagcaagaat   1980

atcacctttg gagtcgaaga tcttaaagac ctgatctcaa ctctaggaga taaccatggg   2040

gaatgttcgg ttgctagtag ctacaaaacc agcaaaacag attcgatttg tccatcacga   2100

gtccgtgcaa tgctagcatc ccgagcatgc agatcatctg tgatgatcgg agatccactc   2160

agaaaaaacg aaatgcagaa gatagtagaa cacttggcag atctcgaatc tccttggaat   2220

tgcccacacg gacgaccaac aatgcgtcat cttgtggact tgacaacttt actcacatta   2280
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cctgatgacg acaatgtcaa tgatgatgat gatgatgatg caaccatctc attggcatga   2340

<210>   31
<211>   779
<212>   PRT
<213>   Arabidopsis thaliana

<400>   31

Met Gln Gly Asp Ser Ser Pro Ser Pro Thr Thr Thr Ser Ser Pro Leu
1   5   10   15

Ile Arg Pro Ile Asn Arg Asn Val Ile His Arg Ile Cys Ser Gly Gln
                20   25   30

Val Ile Leu Asp Leu Ser Ser Ala Val Lys Glu Leu Val Glu Asn Ser
            35   40   45

Leu Asp Ala Gly Ala Thr Ser Ile Glu Ile Asn Leu Arg Asp Tyr Gly
        50   55   60

Glu Asp Tyr Phe Gln Val Ile Asp Asn Gly Cys Gly Ile Ser Pro Thr
65   70   75   80

Asn Phe Lys Val Cys Val Gln Ile Leu Arg Arg Thr Phe Asp Val Leu
                85   90   95

Ala Leu Lys His His Thr Ser Lys Leu Glu Asp Phe Thr Asp Leu Leu
            100   105   110

Asn Leu Thr Thr Tyr Gly Phe Arg Gly Glu Ala Leu Ser Ser Leu Cys
        115   120   125

Ala Leu Gly Asn Leu Thr Val Glu Thr Arg Thr Lys Asn Glu Pro Val
    130   135   140

Ala Thr Leu Leu Thr Phe Asp His Ser Gly Leu Leu Thr Ala Glu Lys
145   150   155   160

Lys Thr Ala Arg Gln Ile Gly Thr Thr Val Thr Val Arg Lys Leu Phe
                165   170   175

Ser Asn Leu Pro Val Arg Ser Lys Glu Phe Lys Arg Asn Ile Arg Lys
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Glu Tyr Gly Lys Leu Val Ser Leu Leu Asn Ala Tyr Ala Leu Ile Ala
            195   200   205

Lys Gly Val Arg Phe Val Cys Ser Asn Thr Thr Gly Lys Asn Pro Lys
    210   215   220

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Ser Val Val Leu Asn Thr Gln Gly Arg Gly Ser Leu Lys Asp Asn Ile
225                 230             235                     240

Ile Thr Val Phe Gly Ile Ser Thr Phe Thr Ser Leu Gln Pro Gly Thr
                245             250             255

Gly Arg Asn Leu Ala Asp Arg Gln Tyr Phe Phe Ile Asn Gly Arg Pro
            260             265             270

Val Asp Met Pro Lys Val Ser Lys Leu Val Asn Glu Leu Tyr Lys Asp
        275             280             285

Thr Ser Ser Arg Lys Tyr Pro Val Thr Ile Leu Asp Phe Ile Val Pro
    290             295             300

Gly Gly Ala Cys Asp Leu Asn Val Thr Pro Asp Lys Arg Lys Val Phe
305             310             315                     320

Phe Ser Asp Glu Thr Ser Val Ile Gly Ser Leu Arg Glu Gly Leu Asn
            325             330             335

Glu Ile Tyr Ser Ser Ser Asn Ala Ser Tyr Ile Val Asn Arg Phe Glu
            340             345             350

Glu Asn Ser Glu Gln Pro Asp Lys Ala Gly Val Ser Ser Phe Gln Lys
        355             360             365

Lys Ser Asn Leu Leu Ser Glu Gly Ile Val Leu Asp Val Ser Ser Lys
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Thr Arg Leu Gly Glu Ala Ile Glu Lys Glu Asn Pro Ser Leu Arg Glu
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Val Glu Ile Asp Asn Ser Ser Pro Met Glu Lys Phe Lys Phe Glu Ile
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Lys Ala Cys Gly Thr Lys Lys Gly Glu Gly Ser Leu Ser Val His Asp
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Val Thr His Leu Asp Lys Thr Pro Ser Lys Gly Leu Pro Gln Leu Asn
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Val Thr Glu Lys Val Thr Asp Ala Ser Lys Asp Leu Ser Ser Arg Ser
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Ser Phe Ala Gln Ser Thr Leu Asn Thr Phe Val Thr Met Gly Lys Arg
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Asn Gln Thr Ser Ser Tyr Arg Val Glu Lys Ser Lys Phe Glu Val Arg
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Ala Leu Ala Ser Arg Cys Leu Val Glu Gly Asp Gln Leu Asp Asp Met
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Val Ile Ser Lys Glu Asp Met Thr Pro Ser Glu Arg Asp Ser Glu Leu
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Gly Asn Arg Ile Ser Pro Gly Thr Gln Ala Asp Asn Val Glu Arg His
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Glu Arg Val Leu Gly Gln Phe Asn Leu Gly Phe Ile Ile Ala Lys Leu
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Glu Arg Asp Leu Phe Ile Val Asp Gln His Ala Ala Asp Glu Lys Phe
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Asn Phe Glu His Leu Ala Arg Ser Thr Val Leu Asn Gln Gln Pro Leu
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Leu Gln Pro Leu Asn Leu Glu Leu Ser Pro Glu Glu Glu Val Thr Val
        610                 615                 620

Leu Met His Met Asp Ile Ile Arg Glu Asn Gly Phe Leu Leu Glu Glu
625                 630                 635                 640

Asn Pro Ser Ala Pro Pro Gly Lys His Phe Arg Leu Arg Ala Ile Pro
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Tyr Ser Lys Asn Ile Thr Phe Gly Val Glu Asp Leu Lys Asp Leu Ile
            660                 665                 670

Ser Thr Leu Gly Asp Asn His Gly Glu Cys Ser Val Ala Ser Ser Tyr
        675                 680                 685

Lys Thr Ser Lys Thr Asp Ser Ile Cys Pro Ser Arg Val Arg Ala Met
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Leu Ala Ser Arg Ala Cys Arg Ser Ser Val Met Ile Gly Asp Pro Leu
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Arg Lys Asn Glu Met Gln Lys Ile Val Glu His Leu Ala Asp Leu Glu
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Phe Asn Ser Leu Asp Ala Gly Ala Thr Lys Val Ser Ile Phe Val Gly
            35                  40                  45


Val Val Ser Cys Ser Val Lys Val Val Asp Gly Ser Gly Val Ser
        50                  55                  60


Arg Asp Asp Leu Val Leu Leu Gly Glu Arg Tyr Ala Thr Ser Lys Phe
65                  70                  75                  80


His Asp Phe Thr Asn Val Glu Thr Ala Ser Glu Thr Phe Gly Phe Arg
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Gly Glu Ala Leu Ala Ser Ile Ser Asp Ile Ser Leu Leu Glu Val Arg
            100                 105                 110


Thr Lys Ala Ile Gly Arg Pro Asn Gly Tyr Arg Lys Val Met Lys Gly
            115                 120                 125


Ser Lys Cys Leu His Leu Gly Ile Asp Asp Asp Arg Lys Asp Ser Gly
        130                 135                 140


Thr Thr Val Thr Val Arg Asp Leu Phe Tyr Ser Gln Pro Val Arg Arg
145                 150                 155                 160


Lys Tyr Met Gln Ser Ser Pro Lys Lys Val Leu Glu Ser Ile Lys Lys
                165                 170                 175


Cys Val Phe Arg Ile Ala Leu Val His Ser Asn Val Ser Phe Ser Val
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Leu Asp Ile Glu Ser Asp Glu Glu Leu Phe Gln Thr Asn Pro Ser Ser
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Ser Ala Phe Ser Leu Leu Met Arg Asp Ala Gly Thr Glu Ala Val Asn
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Ser Leu Cys Lys Val Asn Val Thr Asp Gly Met Leu Asn Val Ser Gly
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Phe Glu Cys Ala Asp Asp Trp Lys Pro Thr Asp Gly Gln Gln Thr Gly
            245                 250                 255

Arg Arg Asn Arg Leu Gln Ser Asn Pro Gly Tyr Ile Leu Cys Ile Ala
        260                 265                 270

Cys Pro Arg Arg Leu Tyr Glu Phe Ser Phe Glu Pro Ser Lys Thr His
        275                 280                 285

Val Glu Phe Lys Lys Trp Gly Pro Val Leu Ala Phe Ile Glu Arg Ile
        290                 295                 300

Thr Leu Ala Asn Trp Lys Lys Asp Arg Ile Leu Glu Leu Phe Asp Gly
305                 310                 315                 320

Gly Ala Asp Ile Leu Ala Lys Gly Asp Arg Gln Asp Leu Ile Asp Asp
            325                 330                 335

Lys Ile Arg Leu Gln Asn Gly Ser Leu Phe Ser Ile Leu His Phe Leu
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Asp Ala Asp Trp Pro Glu Ala Met Glu Pro Ala Lys Lys Lys Leu Lys
        355                 360                 365

Arg Ser Asn Asp His Ala Pro Cys Ser Ser Leu Leu Phe Pro Ser Ala
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Asp Phe Lys Gln Asp Gly Asp Tyr Phe Ser Pro Arg Lys Asp Val Trp
385                 390                 395                 400

Ser Pro Glu Cys Glu Val Glu Leu Lys Ile Gln Asn Pro Lys Glu Gln
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Gly Thr Val Ala Gly Phe Glu Ser Arg Thr Asp Ser Leu Leu Gln Ser
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Arg Asp Ile Glu Met Gln Thr Asn Glu Asp Phe Pro Gln Val Thr Asp
        435                 440                 445
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Leu Leu Glu Thr Ser Leu Val Ala Asp Ser Lys Cys Arg Lys Gln Phe
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Met Lys Asp Ser Asp Val Leu Asn Phe Gln Phe Gln Gly Leu Lys Asp
                485                 490                 495

Glu Leu Asp Val Ser Asn Cys Ile Gly Lys His Leu Leu Arg Gly Cys
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Ser Ser Arg Val Ser Leu Thr Phe His Glu Pro Lys Leu Ser His Val
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Glu Gly Tyr Glu Ser Val Val Pro Met Ile Pro Asn Glu Lys Gln Ser
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Ser Pro Arg Val Leu Glu Thr Arg Glu Gly Gly Ser Tyr Cys Asp Val
545                 550                 555                 560

Tyr Ser Asp Lys Thr Pro Asp Cys Ser Leu Gly Ser Ser Trp Gln Asp
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Thr Asp Trp Phe Thr Pro Gln Cys Ser Ser Asp Arg Gly Cys Val Gly
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Ile Gly Glu Asp Phe Asn Ile Thr Pro Ile Asp Thr Ala Glu Phe Asp
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Ser Tyr Asp Glu Lys Val Gly Ser Lys Lys Tyr Leu Ser Ser Val Asn
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Val Gly Ser Ser Val Thr Gly Ser Phe Cys Leu Ser Ser Glu Trp Ser
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Pro Met Tyr Ser Thr Pro Ser Ala Thr Lys Trp Glu Ser Glu Tyr Gln
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Lys Gly Cys Arg Ile Leu Glu Gln Ser Leu Arg Leu Gly Arg Met Pro
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Asp Pro Glu Phe Cys Phe Ser Ala Ala Asn Asn Ile Lys Phe Asp His
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Glu Val Ile Pro Glu Met Asp Cys Cys Glu Thr Gly Thr Asp Ser Phe
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Lys Glu Lys Phe Ser Tyr Met Asp Gly Thr Gln Asn Asn Ala Gly Lys
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Gln Arg Ser Lys Arg Ser Arg Ser Ala Pro Pro Tyr Arg Glu Lys
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Lys Arg Phe Ile Ser Leu Ser Cys Lys Ser Asp Thr Lys Pro Lys Asn
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Ser Asp Pro Ser Glu Pro Asp Asp Leu Glu Cys Leu Thr Gln Pro Cys
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Asn Ala Ser Gln Met His Leu Lys Cys Ser Ile Leu Asp Asp Val Ser
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Tyr Asp His Ile Gln Glu Thr Glu Lys Arg Leu Ser Ser Ala Ser Asp
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Leu Lys Ala Ser Ala Gly Cys Arg Thr Val His Ser Glu Thr Gln Asp
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Glu Asp Val His Glu Asp Phe Ser Ser Glu Glu Phe Leu Asp Pro Ile
    850                 855                 860


Lys Ser Thr Thr Lys Trp Arg His Asn Cys Ala Val Ser Gln Val Pro
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Lys Glu Ser His Glu Leu His Gly Gln Asp Gly Val Phe Asp Ile Ser
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Ser Gly Leu Leu His Leu Arg Ser Asp Glu Ser Leu Val Pro Glu Ser
            900                 905                 910


Ile Asn Arg His Ser Leu Glu Asp Ala Lys Val Leu Gln Gln Val Asp
            915                 920                 925


Lys Lys Tyr Ile Pro Ile Val Ala Cys Gly Thr Val Ala Ile Val Asp
    930                 935                 940


Gln His Ala Ala Asp Glu Arg Ile Arg Leu Glu Glu Leu Arg Thr Lys
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Ser Thr  Ile Pro Pro Ser Val  Leu Arg Val Leu Asn  Ser Lys Ala
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Cys Arg  Gly Ala Ile Met Phe  Gly Asp Ser Leu Leu  Pro Ser Glu
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Cys Ser  Leu Ile Ile Asp Gly  Leu Lys Gln Thr Ser  Leu Cys Phe
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Gln Cys  Ala His Gly Arg Pro  Thr Thr Val Pro Leu  Val Asp Leu
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Lys Ala  Leu His Lys Gln Ile  Ala Lys Leu Ser Gly  Arg Gln Val
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Asp Ala Ser Val Arg Phe Ala Val Ser Lys Ser Val Asp Glu Val Arg
    50                  55                  60

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              85   90   95

Asn Ile Met His Lys Phe Val Lys Val Asp Asp Arg Asp Cys Ser Gly
              100   105   110

Glu Arg Ser Arg Glu Asp Val Val Pro Leu Asn Asp Ser Ser Leu Cys
          115   120   125

Met Lys Ala Asn Asp Val Ile Pro Gln Phe Arg Ser Asn Asn Gly Lys
      130   135   140

Thr Gln Glu Arg Asn His Ala Phe Ser Phe Ser Gly Arg Ala Glu Leu
145   150   155   160

Arg Ser Val Glu Asp Ile Gly Val Asp Gly Asp Val Pro Gly Pro Glu
              165   170   175

Thr Pro Gly Met Arg Pro Arg Ala Ser Arg Leu Lys Arg Val Leu Glu
          180   185   190

Asp Glu Met Thr Phe Lys Glu Asp Lys Val Pro Val Leu Asp Ser Asn
          195   200   205

Lys Arg Leu Lys Met Leu Gln Asp Pro Val Cys Gly Glu Lys Lys Glu
      210   215   220

Val Asn Glu Gly Thr Lys Phe Glu Trp Leu Glu Ser Ser Arg Ile Arg
225   230   235   240

Asp Ala Asn Arg Arg Arg Pro Asp Asp Pro Leu Tyr Asp Arg Lys Thr
              245   250   255

Leu His Ile Pro Pro Asp Val Phe Lys Lys Met Ser Ala Ser Gln Lys
          260   265   270

Gln Tyr Trp Ser Val Lys Ser Glu Tyr Met Asp Ile Val Leu Phe Phe
      275   280   285

Lys Val Gly Lys Phe Tyr Glu Leu Tyr Glu Leu Asp Ala Glu Leu Gly
      290   295   300

His Lys Glu Leu Asp Trp Lys Met Thr Met Ser Gly Val Gly Lys Cys
305   310   315   320

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Arg Gln Val Gl_ Ile Ser Glu Ser Gly Ile Asp Glu Ala Val Gln Lys
            325               330               335

Leu Leu Ala Arg Gly Tyr Lys Val Gly Arg Ile Glu Gln Leu Glu Thr
            340               345               350

Ser Asp Gln Ala Lys Ala Arg Gly Ala Asn Thr Ile Ile Pro Arg Lys
            355               360               365

Leu Val Gln Val Leu Thr Pro Ser Thr Ala Ser Glu Gly Asn Ile Gly
        370               375               380

Pro Asp Ala Val His Leu Leu Ala Ile Lys Glu Ile Lys Met Glu Leu
    385               390               395               400

Gln Lys Cys Ser Thr Val Tyr Gly Phe Ala Phe Val Asp Cys Ala Ala
            405               410               415

Leu Arg Phe Trp Val Gly Ser Ile Ser Asp Asp Ala Ser Cys Ala Ala
            420               425               430

Leu Gly Ala Leu Leu Met Gln Val Ser Pro Lys Glu Val Leu Tyr Asp
            435               440               445

Ser Lys Gly Leu Ser Arg Glu Ala Gln Lys Ala Leu Arg Lys Tyr Thr
        450               455               460

Leu Thr Gly Ser Thr Ala Val Gln Leu Ala Pro Val Pro Gln Val Met
    465               470               475               480

Gly Asp Thr Asp Ala Ala Gly Val Arg Asn Ile Ile Glu Ser Asn Gly
            485               490               495

Tyr Phe Lys Gly Ser Ser Glu Ser Trp Asn Cys Ala Val Asp Gly Leu
            500               505               510

Asn Glu Cys Asp Val Ala Leu Ser Ala Leu Gly Glu Leu Ile Asn His
            515               520               525

Leu Ser Arg Leu Lys Leu Glu Asp Val Leu Lys His Gly Asp Ile Phe
        530               535               540

Pro Tyr Gln Val Tyr Arg Gly Cys Leu Arg Ile Asp Gly Gln Thr Met
    545               550               555               560

Val Asn Leu Glu Ile Phe Asn Asn Ser Cys Asp Gly Gly Pro Ser Gly
            565               570               575
```

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Thr Leu Tyr Lys Tyr Leu . sp Asn Cys Val Ser Pro Thr Gly Lys Arg
        580   585   590

Leu Leu Arg Asn Trp Ile Cys His Pro Leu Lys Asp Val Glu Ser Ile
        595   600   605

Asn Lys Arg Leu Asp Val Val Glu Glu Phe Thr Ala Asn Ser Glu Ser
    610   615   620

Met Gln Ile Thr Gly Gln Tyr Leu His Lys Leu Pro Asp Leu Glu Arg
625   630   635   640

Leu Leu Gly Arg Ile Lys Ser Ser Val Arg Ser Ser Ala Ser Val Leu
            645   650   655

Pro Ala Leu Leu Gly Lys Lys Val Leu Lys Gln Arg Val Lys Ala Phe
            660   665   670

Gly Gln Ile Val Lys Gly Phe Arg Ser Gly Ile Asp Leu Leu Leu Ala
        675   680   685

Leu Gln Lys Glu Ser Asn Met Met Ser Leu Leu Tyr Lys Leu Cys Lys
    690   695   700

Leu Pro Ile Leu Val Gly Lys Ser Gly Leu Glu Leu Phe Leu Ser Gln
705   710   715   720

Phe Glu Ala Ala Ile Asp Ser Asp Phe Pro Asn Tyr Gln Asn Gln Asp
            725   730   735

Val Thr Asp Glu Asn Ala Glu Thr Leu Thr Ile Leu Ile Glu Leu Phe
            740   745   750

Ile Glu Arg Ala Thr Gln Trp Ser Glu Val Ile His Thr Ile Ser Cys
        755   760   765

Leu Asp Val Leu Arg Ser Phe Ala Ile Ala Ala Ser Leu Ser Ala Gly
    770   775   780

Ser Met Ala Arg Pro Val Ile Phe Pro Glu Ser Glu Ala Thr Asp Gln
785   790   795   800

Asn Gln Lys Thr Lys Gly Pro Ile Leu Lys Ile Gln Gly Leu Trp His
            805   810   815

Pro Phe Ala Val Ala Ala Asp Gly Gln Leu Pro Val Pro Asn Asp Ile
            820   825   830

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```
Leu Leu Gly Glu Ala Arg Arg Ser Se  Gly Ser Ile His Pro Arg Ser
        835                 840                 845


Leu Leu Leu Thr Gly Pro Asn Met Gly Gly Lys Ser Thr Leu Leu Arg
    850                 855                 860


Ala Thr Cys Leu Ala Val Ile Phe Ala Gln Leu Gly Cys Tyr Val Pro
865                 870                 875                 880


Cys Glu Ser Cys Glu Ile Ser Leu Val Asp Thr Ile Phe Thr Arg Leu
            885                 890                 895


Gly Ala Ser Asp Arg Ile Met Thr Gly Glu Ser Thr Phe Leu Val Glu
        900                 905                 910


Cys Thr Glu Thr Ala Ser Val Leu Gln Asn Ala Thr Gln Asp Ser Leu
        915                 920                 925


Val Ile Leu Asp Glu Leu Gly Arg Gly Thr Ser Thr Phe Asp Gly Tyr
    930                 935                 940


Ala Ile Ala Tyr Ser Val Phe Arg His Leu Val Glu Lys Val Gln Cys
945                 950                 955                 960


Arg Met Leu Phe Ala Thr His Tyr His Pro Leu Thr Lys Glu Phe Ala
            965                 970                 975


Ser His Pro Arg Val Thr Ser Lys His Met Ala Cys Ala Phe Lys Ser
        980                 985                 990


Arg Ser Asp Tyr Gln Pro Arg Gly  Cys Asp Gln Asp Leu  Val Phe Leu
        995                 1000                1005


Tyr Arg  Leu Thr Glu Gly Ala  Cys Pro Glu Ser Tyr  Gly Leu Gln
    1010    .               1015                1020


Val Ala  Leu Met Ala Gly Ile  Pro Asn Gln Val Val  Glu Thr Ala
    1025                1030                1035


Ser Gly  Ala Ala Gln Ala Met  Lys Arg Ser Ile Gly  Glu Asn Phe
    1040                1045                1050


Lys Ser  Ser Glu Leu Arg Ser  Glu Phe Ser Ser Leu  His Glu Asp
    1055                1060                1065


Trp Leu  Lys Ser Leu Val Gly  Ile Ser Arg Val Ala  His Asn Asn
    1070                1075                1080
```
                              Page 75

```
Ala Pro  Ile Gly Glu Asp Asp  Tyr Asp Thr Leu Phe  Cys Leu Trp
    1085              1090              1095

His Glu  Ile Lys Ser Ser Tyr  Cys Val Pro Lys
    1100              1105


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<213>  Homo sapiens

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ctcggaaacc gccagacacc aaggctcgga tccacgcca ggccacgacg gagggcgact      180

acctcccttc tgaccctgct gctggcgttc ggaaaaaacg cagtccggtg tgctctgatt     240

ggtccaggct ctttgacgtc acggactcga cctttgacag agccactagg cgaaaaggag     300

agacgggaag tattttttcc gccccgcccg gaaagggtgg agcacaacgt cgaaagcagc     360

cgttgggagc ccaggaggcg gggcgcctgt gggagccgtg gagggaactt tcccagtccc     420

cgaggcggat ccggtgttgc atccttggag cgagctgaga actcgagtac agaacctgct     480

aaggccatca aacctattga tcggaagtca gtccatcaga tttgctctgt gccggtggta     540

ccgagtctaa ggccgaatgc ggtgaaggag ttagtagaaa acagtctgga tgctggtgcc     600

actaatgttg atctaaagct taaggactat ggagtggatc tcattgaagt ttcaggcaat     660

ggatgtgggg tagaagaaga aaaacttcgaa ggctttactc tgaaacatca cacatgtaag     720

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cccagaggga tgacagtcag cgtgaagcag ttattttcta cgctacctgt gcaccataaa     960

gaatttcaaa ggaatattaa gaagaaacgt gcctgcttcc ccttcgcctt ctgccgtgat    1020

tgtcagtttc ctgaggcctc cccagccatg cttcctgtac agcctgtaga actgactcct    1080

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gtcaagaatg gtccaggttc ttctagatga                                      1170


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<213>  Homo sapiens

<400>  37
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Met Ala Gln Pro Lys Gln Glu Arg Val Ala Arg Ala Arg His Gln Arg
1               5                   10                  15


Ser Glu Thr Ala Arg His Gln Arg Ser Glu Thr Ala Lys Thr Pro Thr
                20                  25                  30


Leu Gly Asn Arg Gln Thr Pro Thr Leu Gly Asn Arg Gln Thr Pro Arg
            35                  40                  45


Leu Gly Ile His Ala Arg Pro Arg Arg Arg Ala Thr Thr Ser Leu Leu
        50                  55                  60


Thr Leu Leu Leu Ala Phe Gly Lys Asn Ala Val Arg Cys Ala Leu Ile
65                  70                  75                  80


Gly Pro Gly Ser Leu Thr Ser Arg Thr Arg Pro Leu Thr Glu Pro Leu
                85                  90                  95


Gly Glu Lys Glu Arg Arg Glu Val Phe Phe Pro Pro Arg Pro Glu Arg
            100                 105                 110


Val Glu His Asn Val Glu Ser Ser Arg Trp Glu Pro Arg Arg Arg Gly
        115                 120                 125


Ala Cys Gly Ser Arg Gly Gly Asn Phe Pro Ser Pro Arg Gly Gly Ser
        130                 135                 140


Gly Val Ala Ser Leu Glu Arg Ala Glu Asn Ser Ser Thr Glu Pro Ala
145                 150                 155                 160


Lys Ala Ile Lys Pro Ile Asp Arg Lys Ser Val His Gln Ile Cys Ser
                165                 170                 175


Gly Pro Val Val Pro Ser Leu Arg Pro Asn Ala Val Lys Glu Leu Val
            180                 185                 190


Glu Asn Ser Leu Asp Ala Gly Ala Thr Asn Val Asp Leu Lys Leu Lys
        195                 200                 205


Asp Tyr Gly Val Asp Leu Ile Glu Val Ser Gly Asn Gly Cys Gly Val
    210                 215                 220


Glu Glu Glu Asn Phe Glu Gly Phe Thr Leu Lys His His Thr Cys Lys
225                 230                 235                 240


Ile Gln Glu Phe Ala Asp Leu Thr Gln Val Glu Thr Phe Gly Phe Arg
            245                 250                 255
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Gly Glu Ala Leu Ser Ser Leu Cys Ala Leu Ser Asp Val Thr Ile Ser
              260                 265                 270

Thr Cys Arg Val Ser Ala Lys Val Gly Thr Arg Leu Val Phe Asp His
          275                 280                 285

Tyr Gly Lys Ile Ile Gln Lys Thr Pro Tyr Pro Arg Pro Arg Gly Met
      290                 295                 300

Thr Val Ser Val Lys Gln Leu Phe Ser Thr Leu Pro Val His His Lys
305                 310                 315                 320

Glu Phe Gln Arg Asn Ile Lys Lys Lys Arg Ala Cys Phe Pro Phe Ala
              325                 330                 335

Phe Cys Arg Asp Cys Gln Phe Pro Glu Ala Ser Pro Ala Met Leu Pro
              340                 345                 350

Val Gln Pro Val Glu Leu Thr Pro Arg Ser Thr Pro Pro His Pro Cys
          355                 360                 365

Ser Leu Glu Asp Asn Val Ile Thr Val Phe Ser Ser Val Lys Asn Gly
      370                 375                 380

Pro Gly Ser Ser Arg
385


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gagcagaaca gccttggtga ggtggacagg aggggacctc gcgagcagac gcgcgcgcca      180

gcgacagcag ccccgccccg gcctctcggg agccgggggg cagaggctgc ggagccccag      240

gagggtctat cagccacagt ctctgcatgt ttccaagagc aacaggaaat gaacacattg      300

caggggccag tgtcattcaa agatgtggct gtggatttca cccaggagga gtggcggcaa      360

ctggaccctg atgagaagat agcatacggg gatgtgatgt tggagaacta cagccatcta      420

gtttctgtgg ggtatgatta tcaccaagcc aaacatcatc atggagtgga ggtgaaggaa      480

gtggagcagg agaggagcc gtggataatg gaaggtgaat tccatgtca acatagtcca      540

gaacctgcta aggccatcaa acctattgat cggaagtcag tccatcagat ttgctctggg      600

ccagtggtac tgagtctaag cactgcagtg aaggagttag tagaaaacag tctggatgct      660
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ggtgccacta atattgatct aaagcttaag gactatggag tggatctcat tgaagtttca      720

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acatcacaca tgtaa                                                       795


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<213>  Homo sapiens

<400>  39

Met Cys Pro Trp Arg Pro Arg Leu Gly Arg Arg Cys Met Val Ser Pro
1               5                   10                  15


Arg Glu Ala Asp Leu Gly Pro Gln Lys Asp Thr Arg Leu Asp Leu Pro
                20                  25                  30


Arg Ser Pro Ala Arg Ala Pro Arg Glu Gln Asn Ser Leu Gly Glu Val
            35                  40                  45


Asp Arg Arg Gly Pro Arg Glu Gln Thr Arg Ala Pro Ala Thr Ala Ala
    50                  55                  60


Pro Pro Arg Pro Leu Gly Ser Arg Gly Ala Glu Ala Ala Glu Pro Gln
65                  70                  75                  80


Glu Gly Leu Ser Ala Thr Val Ser Ala Cys Phe Gln Glu Gln Gln Glu
                85                  90                  95


Met Asn Thr Leu Gln Gly Pro Val Ser Phe Lys Asp Val Ala Val Asp
                100                 105                 110


Phe Thr Gln Glu Glu Trp Arg Gln Leu Asp Pro Asp Glu Lys Ile Ala
            115                 120                 125


Tyr Gly Asp Val Met Leu Glu Asn Tyr Ser His Leu Val Ser Val Gly
    130                 135                 140


Tyr Asp Tyr His Gln Ala Lys His His His Gly Val Glu Val Lys Glu
145                 150                 155                 160


Val Glu Gln Gly Glu Glu Pro Trp Ile Met Glu Gly Glu Phe Pro Cys
                165                 170                 175


Gln His Ser Pro Glu Pro Ala Lys Ala Ile Lys Pro Ile Asp Arg Lys
                180                 185                 190


Ser Val His Gln Ile Cys Ser Gly Pro Val Val Leu Ser Leu Ser Thr
    195                 200                 205
```

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```
Ala Val Lys Glu Leu Val Glu Asn Ser Leu Asp Ala Gly Ala Thr Asn
    210                 215                 220

Ile Asp Leu Lys Leu Lys Asp Tyr Gly Val Asp Leu Ile Glu Val Ser
225                 230                 235                 240

Asp Asn Gly Cys Gly Val Glu Glu Glu Asn Phe Glu Gly Leu Ile Ser
                245                 250                 255

Phe Ser Ser Glu Thr Ser His Met
                260
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